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Anthropology Scene Detection and Processing

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Foreword

Forensic anthropology and forensic archaeology practitioners assist authorities in the search for and recovery of human remains and associated evidence. In some situations, forensic anthropology or forensic archaeology practitioners may assist a jurisdictional authority (i.e., law enforcement, death scene investigator, medical examiner, or coroner) while in other situations they may be placed in charge of human remains documentation and recovery at a scene. This document is intended to assist forensic archaeology/forensic anthropology practitioners in proper scene detection, processing, handling of evidence, and maintenance of the chain of custody, commensurate with jurisdictional requirements. Archaeological techniques provide the scientific foundation for appropriate detection, processing, documentation, and collection of human remains and associated evidence in a scene. This document was developed to provide guidance to forensic anthropology and forensic archaeology practitioners who assist authorities in detecting and processing forensic scenes.

This document was revised, prepared, and finalized as a standard by the Anthropology Consensus Body of the AAFS Standards Board. The draft of this standard was developed by the Anthropology Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

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All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

Keywords: *forensic archeology, forensic scenes, scene detection, scene search.*

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Anthropology Scene Detection and Processing

1 Scope

This document provides requirements and best practices for forensic anthropology and forensic archaeology practitioners in proper scene detection, processing, handling of evidence, and maintenance of a chain of custody, commensurate with jurisdictional requirements. These requirements and best practices use archaeological techniques and principles as a foundation for scientifically appropriate detection, processing, documentation, and collection of human remains and associated evidence at a scene.

2 Normative References

There are no normative reference documents. Annex A, Bibliography, contains informative references.

3 Terms and Definitions

For purposes of this document, the following definitions apply.

3.1

forensic anthropology scene

A forensic anthropology scene is any environment where human remains and material associations, potentially relevant in a medicolegal setting, may be recovered, and where a forensic anthropology or forensic archaeology practitioner is requested to assist a jurisdictional authority.

3.2

geotaphonomic

Geotaphonomic conditions reflect how the buried body or evidence affects the surrounding environment, in shallow geological and botanical terms. Shallow, in this case, is usually less than 5 meters of depth.

3.3

small-scale

A relatively small ratio between map units and ground units or a small distance between survey or collection units at a scene.

3.4

datum

Datum is a reference system or an approximation of the Earth's surface against which positional measurements are made for computing locations. Horizontal datums are used for describing a point on the Earth's surface, in latitude and longitude or other recognized coordinate systems.

3.5

incident-sterile soil

A soil level in an excavation or grave that does not contain evidence or data relevant to the scene under investigation. It does not mean that it is culturally or archaeologically sterile (e. g. historic or prehistoric artifacts or features may be present but are not related to the event under investigation).

4 Requirements

4.1 General

The practitioner shall have training in archaeological theory and methods and practical field experience, and shall meet jurisdictional requirements.

A scene shall be processed employing archaeological methods to facilitate the thorough recovery of human remains and associated evidence, establish provenience, enable complete documentation, and initiate and maintain chain of custody to the extent possible.

Practitioners shall implement this standard to the fullest extent possible, as applicable, practical, and appropriate. In the absence of specific procedures or in the case of conflicting procedures, the principle, spirit, and intent shall be met.

4.2 Procedure

4.2.1 General

Scenes are highly variable in both type and scale. For example, scenes range from a single body found in a confined space to a mass fatality incident involving many decedents dispersed over a large area. Fire scenes require specialized planning and implementation of excavation techniques due to their complexity.

The boundaries of the scene should be defined and secured. This is usually performed in conjunction with law enforcement. This may be a difficult task as there is no universal method for finding and defining the boundaries of a scene, due to the many possible combinations of soils, vegetation, terrain, and depositional sequences. Considerations also include the completeness of the remains or evidence discovered, the area involved, the state of preservation, as well as potential taphonomic agents impacting dispersal and removal of remains.

Methods based upon general archaeological principles and paradigms shall be used where possible, and method rationale and limitations shall be considered and communicated to the jurisdictional authority.

The goals of the practitioner at any detection and/or recovery operation shall be as follows.

- Select a detection or recovery strategy that maximizes data recorded and physical evidence recovered from a scene while minimizing scene and evidence alteration.
- Establish and fully document the context in which all evidence is found. To the extent possible, the recording of all spatial and contextual associations shall preserve evidence for subsequent analyses.
- Recover and record all evidence that may be relevant to identifying human remains, that may aid in determining the cause and manner of death, reconstructing the scene, determining how the remains were deposited, estimating time since deposition, and identifying post-depositional taphonomic processes.

- Minimize the potential for evidence contamination through the use of appropriate personal protective equipment (PPE) and proper handling of recovered evidence and/or reference samples.
- When appropriate, PPE for biological hazards shall be used. Fire scenes require additional PPE because of unique exposure hazards (see NFPA 921, *Guide for Fire and Explosion Investigations*).
- Facilitate safe and secure collection, transportation and storage of human remains and associated materials from the point of recovery to accession by the appropriate agency.
- Maintain a chain of custody through documentary and photographic records that link the recovered evidence to the scene.
- Document all data, methods, results, interpretation, and conclusions in such a way that verification through independent review can be completed.
- Record spatial data in such a manner that probative information is collected and maintained.

4.2.2 Scene Identification

Search techniques shall be designed to ensure adequate visualization of the search area to the extent possible. The location and boundaries of the search area should be documented in such a manner that records the area searched and facilitates return to the area or expand the search.

Geotaphonomic features (e.g., primary and secondary depressions, differences in soil type, soil texture, soil color, invasive vegetation, vegetation altered by human activity) shall be considered when searching for remains.

Aids such as soil probes, test pits, and geophysical or remote sensing devices may be used to assist in the search for a scene. Scene-specific circumstances and the capabilities and limitations of each aid shall be considered.

4.2.3 Scene Processing

Photographic, written documentation, and video (when appropriate) shall be initiated upon arrival at the scene and continue throughout the search and recovery process to the extent possible.

Remains and associated materials of probative value should be marked as they are discovered and left *in situ* when possible to preserve the context until documentation is complete.

A numbering/labeling system adequate to provide appropriate detail for the type and scale of the scene shall be devised before processing to the extent possible. For example, if the scene involves multiple commingled decedents, a numbering/labeling system shall be used as unique identifiers for each element recovered.

4.2.4 Scene Documentation

If documentation is the responsibility of another expert (e.g., law enforcement), the forensic practitioner shall communicate all pertinent evidence within their area of expertise.

Documentation typically includes a unique case identifier, date and time of the scene recovery, a description of the scene environment, personnel involved, current weather conditions, and a summary of scene recovery actions, and other relevant details.

Photographs shall document the scene before, during, and after processing and should be taken at distances far, medium and close to provide spatial conceptualization of the scene. The process should gradually transition from overall to more detailed documentation of a site or location of human remains and associated materials. Photographic documentation shall minimally include overall photographs of the scene in each of the cardinal directions. Photographs shall contain a scale and a north arrow where appropriate.

When appropriate, a scene diagram or map shall be created to document the spatial distribution of the site or feature or human remains and associated materials. The diagram or map may record the spatial information in two or three dimensions as appropriate for the type and scale of the scene. Acceptable types of diagrams and maps range from hand-drawn sketches to an electronically generated map (e.g., total station, geographic information system-based laser scan, etc.). The type of diagram or map created for the scene shall be appropriate for the type and scale of the scene and question being sought by investigative agencies. The most recent instrument calibration should be noted, and error rates for the mapping instruments should be documented.

Human remains and associated materials shall be referenced in a map or diagram as individual elements or spatially associated groups.

Any diagram or map shall be as accurate as possible and include a north arrow, note indicating “to scale” or “not to scale,” author’s name, date, scene reference code or name, and a datum or reference to the location of the scene.

When appropriate, accurate documentation of datum location shall be obtained using an established permanent datum, permanent structural landmarks or a coordinate point where the Universal Transverse Mercator (UTM) or latitude/longitude was established using a Global Positioning System (GPS) unit. Multiple mapping points may be taken in order to incorporate the scene into Geographic Information System (GIS) maps.

Description of the scene shall be documented (e.g., wooded area, burned house, fresh water creek, etc.).

Any information of potential importance to the post-mortem interval should be recorded when appropriate. These data may include but are not limited to: pattern of thermal or chemical injury, decomposition stage, presence of debris (e.g., fire debris, leaf scatter, soil) found on or around the human remains, evidence of predation or animal scavenging, and evidence of dismemberment.

4.2.5 Surface Scenes

Remains and material evidence, when scattered on the surface, shall be mapped, photographed, and collected as individual elements or spatially associated groups.

Identifiers that are unique shall be assigned to each element, spatially associated group, or piece/unit of evidence and each should be marked with that identifier.

Each element, spatially associated group, or piece/unit of evidence shall be placed in appropriate packaging to preserve the element and identifier.

Elements, spatially associated groups, or pieces/units of evidence shall be documented by the identifying number and the location of collection (horizontal and vertical coordinates) on maps and field drawings.

Surface scenes may result in fragmented and scattered remains, due to environmental conditions and/or scavenger activity. Widening the search area may be necessary to recover all skeletal elements. Collect small bone fragments when discovered if they may be lost during additional recovery work.

Soil samples shall be collected when appropriate. Soil (or other surface debris) surrounding the elements should be screened through appropriate sized wire mesh screens for potential evidence not revealed by simple survey where necessary and as appropriate.

4.2.6 Burial Scenes

Photograph the suspect burial location prior to investigation and throughout each phase of the scene recovery.

Grave outline or features and structure, once discovered, shall be delineated (as opposed to excavating without regard to the walls of the grave). Careful excavation shall include close attention to natural or cultural stratification, size, depth, orientation to the cardinal directions, body position in the feature or grave, tool marks at pit edges and walls, shoe impression in the pit floor, and evidence of disturbance beyond primary deposition.

Excavation should proceed according to natural or cultural strata. Where no identifiable strata exist, arbitrary levels should be excavated by uniform increments.

Grave fill section (profile) drawings are recommended as they can help identify original depth, shape, and even formation processes of the burial feature.

Strata should be excavated and screened separately to record provenience and associations of all evidence found. The size of the screen used varies according to the situation, though ¼-in. mesh is generally recommended. Wet sieving may be appropriate. Soil samples, pollen samples, and other samples should be recorded, mapped and collected when appropriate.

Human remains should be left *in situ* until the area around them is excavated to allow documentation within context. Premature removal of remains or related evidence can eliminate the opportunity to observe and document associations that are essential for interpreting the event under investigation.

Excavation of the grave should extend to the point where incident-sterile soil is reached. After documentation, excavation may be extended into the grave floor to ensure that there are no additional associations (e.g., bullets, etc.). Metal detecting equipment may also be used.

4.2.7 Fire Scenes

Fire scenes present unique safety hazards including the obvious ones, such as a lack of visibility, structural instability, energized electrical circuits, and leaking fuel gases, but the investigator should also consider the less obvious hazards, such as fire gases (CO and HCN), toxic hazards such as asbestos, and biohazards. The Safety chapter of NFPA 921, *Guide for Fire and Explosion Investigations* (Chapter 13, 2017 edition) should be read by anyone who enters a fire scene.

In coordination with the fire investigation team, isolate and limit access to any location that may contain a body. Photograph the suspect area where the body may be located prior to investigation and continue to photograph and document the scene throughout the recovery effort.

Examine, excavate, and secure all debris from above, below, and immediately surrounding the body.

Document the type of debris if identifiable. Potentially informative debris may include personal effects such as ID cards or jewelry.

Collect small fragments of bone when discovered if they are likely to be lost during additional recovery. Place the small fragments of bone in appropriate containers labeled with a reference to the remains, for example “fragments found near right foot”.

The scene documentation should include the position of the body within the scene (for example kitchen or driver’s seat), whether the body is believed to have been moved by first responders, forces associated with the incident or destruction of the structure.

The means, if known, of fire suppression shall be recorded.

Photographs shall be taken of any friable bone that may be altered during transportation.

Preserve friable areas of the body or collect fragments that are expected to be disrupted during transport. For example, placing paper bags over the hands or head may help collect small fragments of bone that become dislodged during transportation, or coat heat-fractured enamel with a clear preservative (e.g., cyanoacrylate). Document the location and materials used for stabilization.

4.2.8 Sampling

Samples of materials (e.g., soil, vegetation, entomological evidence) shall be collected when appropriate and/or feasible. A specialist (e.g., botanist, entomologist, soil chemist) should be consulted for analysis of the samples. Any sampling strategy shall be communicated with the laboratory that will receive and analyze the sample. Depending upon sampling protocol, control samples may be required.

4.3 Considerations

Forensic practitioners (e.g., forensic anthropologists and forensic archaeologists) shall be aware of their roles and responsibilities under the authority or jurisdiction of the scene. They shall have knowledge and training in the appropriate methods used to detect, excavate, collect, preserve, and transport human remains and forensic evidence.

Practitioners should be prepared for field safety hazards and should wear appropriate personal protective gear.

Archaeological principles provide the basis for interpretation of the context in which remains, or evidence are found, and permit scientifically sound association of the provenience of material evidence and/or remains to an incident.

Scenes shall be treated as a crime scene until otherwise determined and managed according to the appropriate forensic principles and procedures that provide for the documentation and security of evidence and maintenance of the chain of custody.

The process of recovery is unavoidably destructive. During the collection and removal of evidence from scenes, actual spatial relationships and associations between transportable and non-transportable evidence are permanently lost. Context is altered or destroyed during the process of recovery, therefore care shall be taken to document and preserve the scene in keeping with appropriate archaeological and forensic evidence preservation practices and in coordination with the agency in charge.

4.4 Reporting

Reports and/or case files shall contain documentation of the process of detection and recovery of the scene, and should include all relevant scene maps and sketches, as well as a description of the methods of recovery, descriptions of findings, lists of evidence recorded, and other relevant information.

5 Conformance

Evidence of documentation showing that the procedures were followed is evidence of conformance.

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Annex A (informative)

Bibliography

The following bibliography is not intended to be an all-inclusive list, review, or endorsement of literature on this topic. The goal of the bibliography is to provide examples of publications addressed in the standard.

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